

1CKL Series 2.0 x 1.6 mm SMD Crystal Oscillator

1 : 2.0×1.6×0.75 mm | SMD2016-4P

CK : 32.768KHz Crystal Oscillator

L : Low Current Crystal Oscillator

Feature

- Miniature Ceramic surface mount with Metal Lid
- CMOS compatible logic levels
- Tri-state function available
- Low power active mode: 7.2μA max
- Supply voltage range : 1.8V ~ 3.3V
- RoHS Compliant / Pb Free

Applications

- Real Time Clock Reference
- Internet of Things (IoT) devices
- Smart meters
- Audio, Video, Gaming products
- Portable Electronics



Electrical Specifications

Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.		32.768		KHz	
Operating Temperature	T_use	-20		70	°C	
		-40		85	°C	
Storage Temperature Range	T_stg	-55		125	°C	
Supply Voltage	Vdd	1.8		3.3	V	
Output Load	L_CMOS		15		pF	
Current Consumption	Icc			7.2	μA	No load condition, Vdd=3.0V
				6.5		No load condition, Vdd=1.8V
Duty Cycle	SYM	45		55	%	50 % Vdd level, L_CMOS ≤ 15 pF
Rise / Fall Time	T _R / T _F			25	nS	10% Vdd to 90% Level
Start-up Time	T_str			20	mS	To 90% of Final Amplitude
High output voltage	V _{OH}	0.9Vdd			V	
Low output voltage	V _{OL}			0.1Vdd	V	
Enable Voltage High (Logic 1)	V _{IH}	0.7Vdd			V	Output will be disable if OE is Logic 0 Output will be enable if OE is Logic 1 or open
Enable Voltage Low (Logic 0)	V _{IL}			0.3Vdd	V	
Enable Voltage Low (Logic 0)	V _{PLZ}			20	mS	
Aging	f_age			3	ppm	1st. Year at 25°C

Frequency Stability & Operating Temperature Range

Temp.	FT	±20ppm	±25ppm	±30ppm	±50ppm
	-20°C to +70°C	△	★	★	★
-40°C to +85°C		△	★	★	

★: Available △: Conditional

All condition: Include 25°C tolerance, operating temperature range, input voltage change, aging, load change.

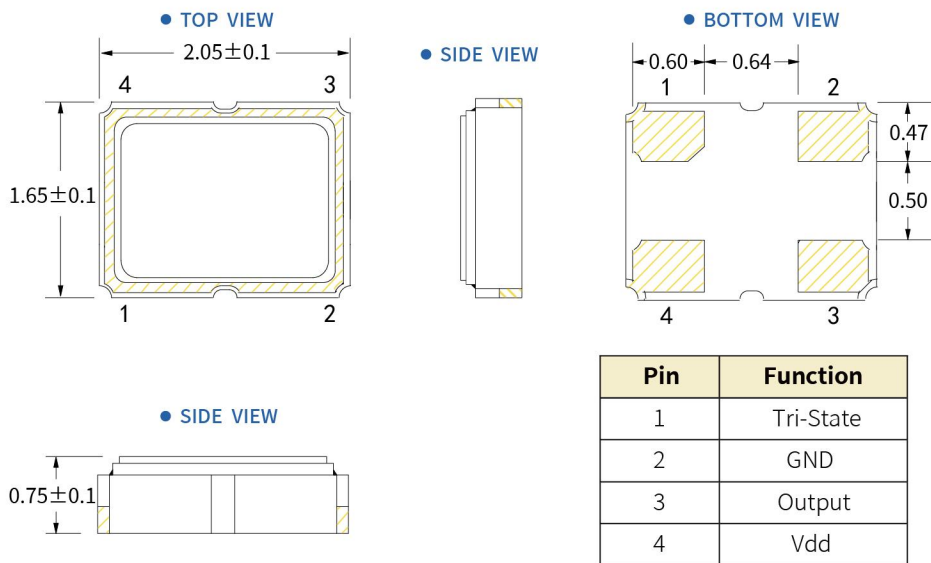
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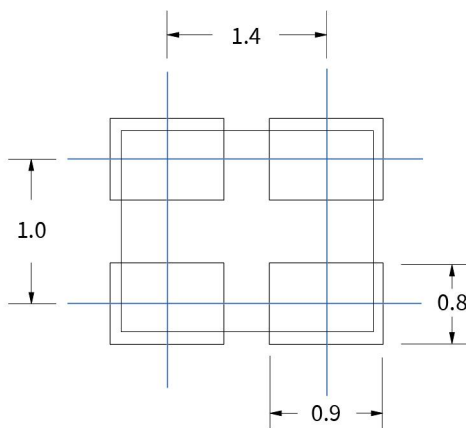
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Dimensions (UNIT:mm)



Solder pad layout (UNIT:mm)



Options and Part Identification : Example SX1M32.768KB20F30TLN

Company	Ceramic Package	Frequency Code [KHz]	Supply Voltage	Frequency Tolerance	Operating Temperature	Frequency Drift	Output	Current Consumption	Phase Noise
SX	1M	32.768K	B	20	F	30	T	L	N
Code Company		Frequency		Code Frequency Tolerance		Code Frequency Drift		Code Current	
SX SCTF		32.768		10 ±10ppm 20 ±20ppm		15 ±15ppm 20 ±20ppm 30 ±30ppm		L 10µA M 7µA P 3µA Q 2µA U 1µA	
	Code Ceramic Package		Code Voltage		Code Operating Temperature		Code Output		Code Phase Noise
	7M 7.0×5.0×1.3mm 5M 5.0×3.2×1.2mm 3M 3.2×2.5×0.95mm 2M 2.5×2.0×0.81mm 1M 2.0×1.6×0.75mm		D 1.8V H 2.5V B 3.3V		E -20°C ~ +70°C F -40°C ~ +85°C		T CMOS		N Standard

If you have other parameter requirements, you can contact **SCTF** at any time.

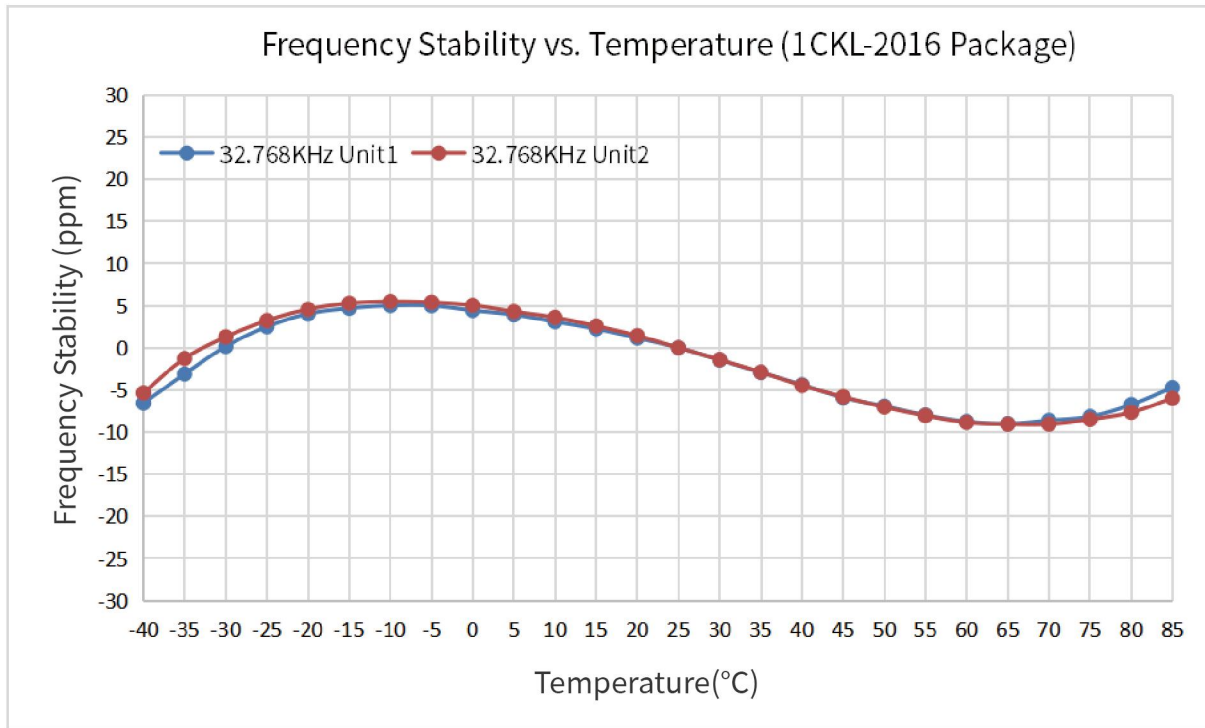
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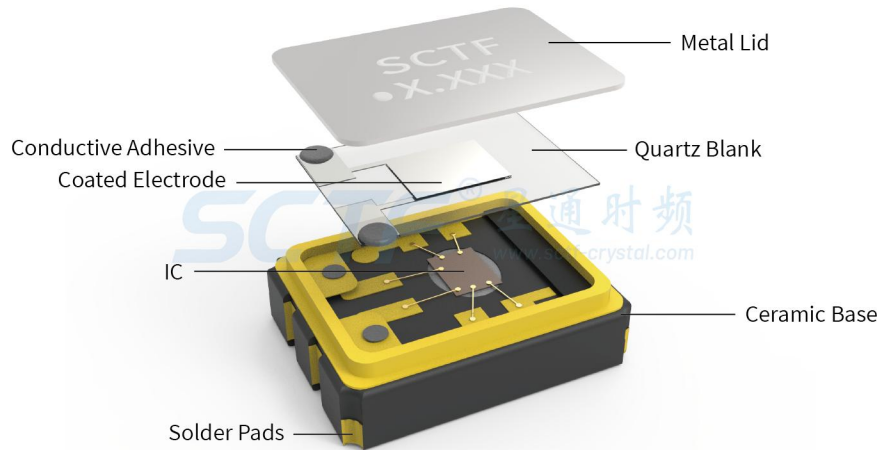
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Frequency Temperature Characteristics



Product Structure & Marking Information

Product Structure



Marking Information



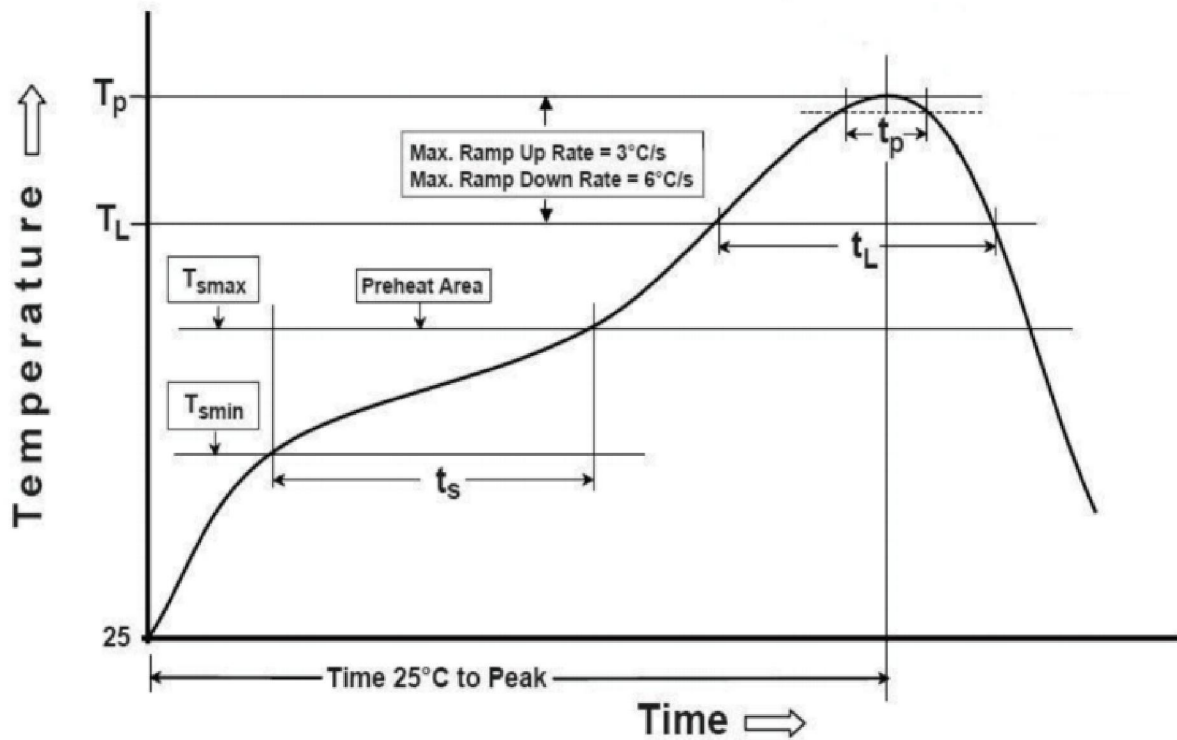
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Suggested Reflow Profile



Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak <ul style="list-style-type: none"> ● Temperature Min (Ts min) ● Temperature Max (Ts max) ● Time (Ts min to Ts max) 	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Ramp - up rate (TL to Tp)	3°C/ second max.	3°C/ second max.
Time maintained above <ul style="list-style-type: none"> ● Liquidous temperature (TL) ● Time (tL) maintained above TL 	183°C 60-150 seconds	217°C 60-150 seconds
Peak package body temperature (Tp)	235°C	260°C
Time within 5° C of the specified classification temperature (Tp)	20 seconds	30 seconds
Ramp - down rate (Tp to TL)	6°C/ second max.	6°C/ second max.
Time 25° C to peak temperature	6 minutes max.	8 minutes max.
Suggest reflow times	2 Times max.	

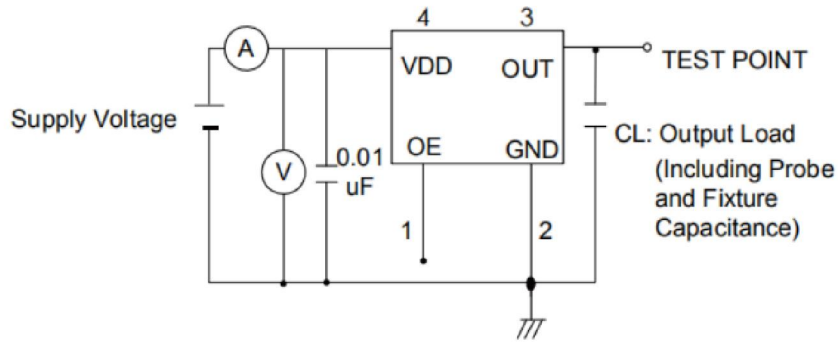
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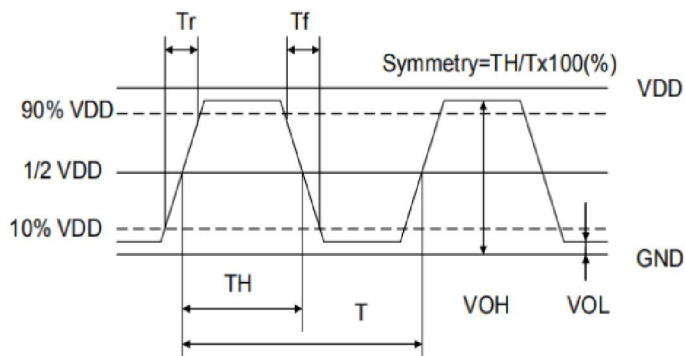
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Testing Circuit



※ Notes: PIN 1 connected to Vdd or floating, the product is working properly; connected to GND, stops working.

Waveform Conditions



Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

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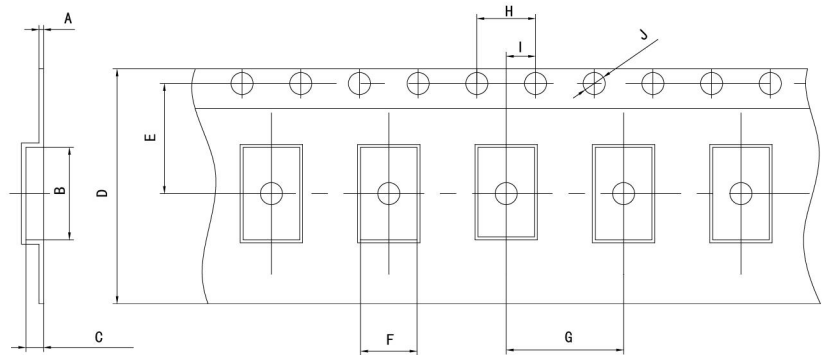
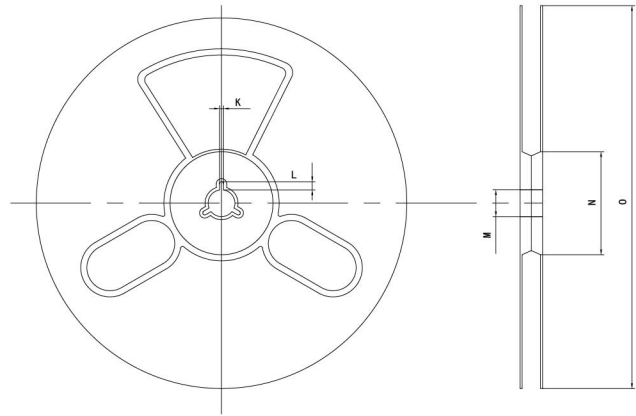
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Packaging Information

T=Tape and reel (3,000pcs/reel)



Pocket Tape Dimensions(mm)

Series	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1CKL	0.25±0.05	2.3±0.1	1.0±0.1	8.0±0.1	3.5±0.1	1.9±0.1	4.0±0.1	4.0±0.1	2.0±0.1	φ1.5±0.1	2.0±0.2	4.0±1.0	φ13±0.5	φ60±1	φ180±1